Project Value Delivery | Large, Complex Project Leadership White Paper Series

White Paper 2024-09

How to Implement Project Management and Control on Very Long Industrial Projects Through Rolling Wave Operational Planning and Control

Industrial projects with a long execution phase (typically in excess of 4-5 years) are not very frequent but require specific approaches in terms of project management and project control. In this White Paper we expose what needs to be specifically done in terms of project control.

The definition of a long project is that the project execution phase exceeds 4-5 years. Very long projects will have an execution phase exceeding 8 years. Please refer to our updated White Paper 2022-10 'How to Prepare for Very Long Industrial Projects' for the definition of long industrial projects and the specific challenges associated with such projects.

PVD recommended approach to management and control of long projects

Limited value in planning in detail for activities that are years away, while maintaining full project overview

On long duration projects, it does not make sense to try to plan in too much detail the project from the beginning to its completion: the way things will be done in a few years' time is not entirely known (just remember how things were done 5 or 10 years ago on your projects!).

Irrespective of the way it is managed and controlled by phases, whatever its duration, an industrial project must reach a sufficient maturity at Final Investment Decision to be successful

Still, it is important to have a sufficient high level view of the main project drivers over the entire project lifecycle to be able to anticipate decisive actions. This view needs to at the right level, which is a matter of experience and judgment, to ensure long lead items are ordered sufficiently early and to ensure that there will be sufficient production capacity for key items.

Unfortunately, we too often observe that maybe due to the long duration of the development phases, the overall integrated schedule of the project is too detailed which creates excessive scheduling workload during project execution, inadequate piloting of activities, and difficulties in rescheduling when faced with project events, leading to inadequate control.

Implement a rolling wave approach with sufficiently stable phases

In our view, the key to success and effectiveness of controlling long duration projects is to effectively divide the project duration in a series of meaningful phases providing a stable planning and project control framework for durations in the order of 2 to 3 years. Those stable phases allow to achieve a full efficiency of delivery for their driving activities. In anticipation of the end of each phase, a re-baseline of the project can be developed, including detailed planning of subsequent phase and of its management and control framework. While this inter-phase transition will require some time and resources, thus diminishing temporarily the delivery efficiency, it will conversely make sure the following phase will reach optimal productivity again. The transition between phases can be used to reshape the project organisation, upgrade information systems etc.

We strongly believe that this phased approach is much preferable to continuous adjustments of the project because it provides all contributors with significant periods of stable delivery environment and concentrates the adaptations to designated moments of the project.

We are deliberately advocating phases of a typical duration of 2-3 years to provide sufficient time to reach optimal productivity for each phase, and to avoid the natural yearly cycle of many projects with public financers or clients: it should be clear that the project management pace should be as independent as possible from yearly budgeting cycles.

A word of caution on project maturity at Final Investment Decision

The rolling wave approach is only applicable to the detailed planning and control of each project phase. It is not applicable to project definition and overall planning of the project! In any case, proper project maturity at Final Investment Decision remains essential. It is not adequate to launch any industrial project whatever their duration without a clear view of the design of the infrastructure, quantities involved, the contracting strategy, key long lead items, and without having, as much as possible, tried to establish a stable environment around the project. Rolling wave only applies to detailed planning, and not to design!

Practical approaches to phasing long duration projects

In some circumstances, this phasing of long projects is more natural. This is the case when programmes can be split in several projects with limited dependencies, that start and finish in different timeframes. It remains

important to have an overview at the right level of the entire programme, but the intermediate phasing is naturally coming through each project, which generally each have a shorter duration.

Example of possible project phasing from nuclear projects

As in most industrial projects, the critical path for building new nuclear facilities is usually civil works followed by piping, or more general MEH (Mechanical = piping, Electrical and HVAC). While the basic design of civil works and MEH needs to happen in parallel in the nuclear industry, particularly because of seismic aspects, the subsequent phases – procurement and construction - follow with some lag between civil works activities and MEH activities.

Implement a rolling wave approach with phases of 2-3 years' duration

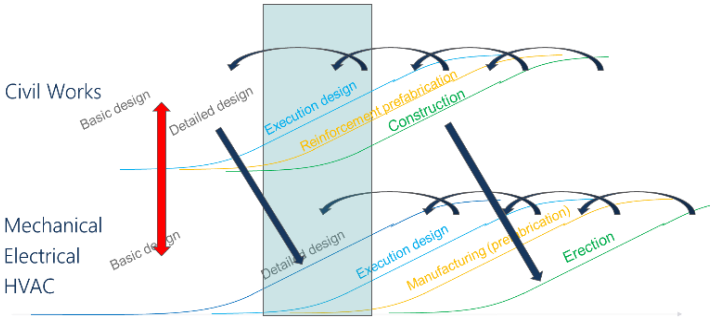
As a practical example, project progress for each main discipline (Civil works, MEH) can be represented by a series of S-curves showing the progress of each step of the project

- Basic design,
- Detailed design,
- Execution design (term used in nuclear projects to cover shop drawings level performed by the manufacturing contractor),
- Manufacturing / prefabrication,
- Erection / construction.

An example of a possible phase of a duration of 2-3 years could hence be: Civil Works Execution Design/Start of Erection & MEH detailed design as per the figure enclosed. This phase could include:

- Core activity with full-fledged productivity approach (MEH detailed design, Civil execution design & pre-fabrication),
- Includes start of Civil Works erection,
- Includes end of MEH basic design by Responsible Designer (specific tracking approach for completion),
- Includes start of MEH execution design by execution designer (specific tracking approach for mobilisation and ramp up, learning curve acceleration etc),
- Includes feedback and change loops to be kept under control between design stages and between disciplines

Dividing a nuclear project into phases



Summary

Long duration projects in execution phase present specific challenges that need to be taken seriously, and the longer the project, the more acute they will become. Managing and controlling those projects requires a specific approach, and, while maintaining a sufficient overview of the entire project delivery, we recommend a rolling wave project control approach with sufficiently long and stable phases during which delivery can reach its peak productivity, separated by transition phases where the project can be re-baselined and the intricacies of the next phases considered. Still, irrespective of the way it is managed and controlled by phases, whatever its duration, an industrial project must reach a sufficient maturity at Final Investment Decision to be successful, and thus a sufficient clarity and understanding of what needs to be built and how it will be built.

You can consult a Project Value Delivery presentation on the topic of this White Paper at the following link: https://fr.slideshare.net/ProjectValueDelivery/dealing-with-extra-long-duration-megaprojects

Read the Industrial Projects Practical Owner Guide

Available on all e-bookstores such as Amazon.com, amazon.co.uk and on Kindle

We Empower Organizations to be Reliably Successful in Executing Large, Complex projects.

Discover more on
www.ProjectValueDelivery.com